



August 25, 2004

Guide to Credit Default Swaptions

Using Credit Options to Express Views and Manage Risk

- ◆ We define payer options and receiver options for credit default swaps and explain how to use them to express bullish and bearish views.

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Derivatives Strategy

	Bullish	Bearish
Less Risk	Buy Receiver <i>Long Call on Credit</i> Maximum gain is $(\text{Strike} - \text{future spread}) \times \text{DV01}$ - premium Maximum Loss is premium	Buy Payer <i>Long Put on Credit</i> Maximum gain is $(\text{Future spread} - \text{strike}) \times \text{DV01}$ - premium Maximum Loss is premium
More Risk	Sell Payer <i>Short Put on Credit</i> Maximum gain is premium Maximum Loss is $(\text{Future spread} - \text{strike}) \times \text{DV01}$ - premium	Sell Receiver <i>Short Call on Credit</i> Maximum gain is premium Maximum Loss is $(\text{Strike} - \text{future spread}) \times \text{DV01}$ - premium

For simplicity, payoffs ignore convexity and assume no credit event. See inside for further details.

Source: Banc of America Securities LLC estimates.

- ◆ Credit default swaptions may express directional views or may hedge risk, and can reduce the cost of carry in shorting a credit. The Credit OAS (COAS) model allows investors to estimate the likelihood that they will make money using an option strategy.
- ◆ We provide examples of potential trades that use credit swaptions in today's market environment:
 - ◆ In **Nordstrom***, spreads have widened about 10 bps since late May on poor earnings and mixed economic data. Buy CDS and sell a payer option to short at close to zero carry.
 - ◆ In **Bombardier***, spreads have widened about 350 bps since late April amid airline industry woes and poor railway revenues. Buy an out-of-the-money receiver option to lock in gains on the credit.
 - ◆ In **General Mills***, there has been progress in a three-year debt reduction program, but risks remain from a pending SEC investigation and the continuing popularity of anti-carbohydrate diets. Spreads tightened 15 bps from March 2004 to June 2004, but have since widened about 5 bps. Sell CDS and an out-of-the-money receiver option for a yield pickup over straight CDS, and to hedge against spread widening.
 - ◆ In **Sun Microsystems***, spreads have been widening, but the Credit OAS (COAS) model suggests a 54% probability that an investor will make money from selling an at-the-money straddle.

* Banc of America Securities LLC was manager or co-manager of a public offering and/or has performed investment banking or other services for this company in the previous 12 months.

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Introduction to Credit Default Swaptions

Credit default swaptions allow investors to express a directional view on credit spreads or to hedge risk

Credit default swaptions, or options for credit default swaps, are a growing market that allow investors to express nontraditional views on credit. Figure 1 presents a simple way to break down an overall credit view (bullish or bearish) and the risk of credit default swaptions:

Figure 1. Expressing Bullish and Bearish Views with CDS Swaptions

	Bullish	Bearish
Less Risk	<p>Buy Receiver <i>Long Call on Credit</i> Maximum gain is (Strike - future spread) x DV01 - premium Maximum Loss is premium</p>	<p>Buy Payer <i>Long Put on Credit</i> Maximum gain is (Future spread - strike) x DV01 - premium Maximum Loss is premium</p>
More Risk	<p>Sell Payer <i>Short Put on Credit</i> Maximum gain is premium Maximum Loss is (Future spread - strike) x DV01 - premium</p>	<p>Sell Receiver <i>Short Call on Credit</i> Maximum gain is premium Maximum Loss is (Strike - future spread) x DV01 - premium</p>

For simplicity, we ignore the convexity adjustment. Maximum gain (loss) for receiver options is the dollar value of the strike, which differs from the DV01 approximation for large changes in spread. Payoffs assume no credit event. Figure 17 shows payoffs following a credit event.

Source: Banc of America Securities LLC estimates.

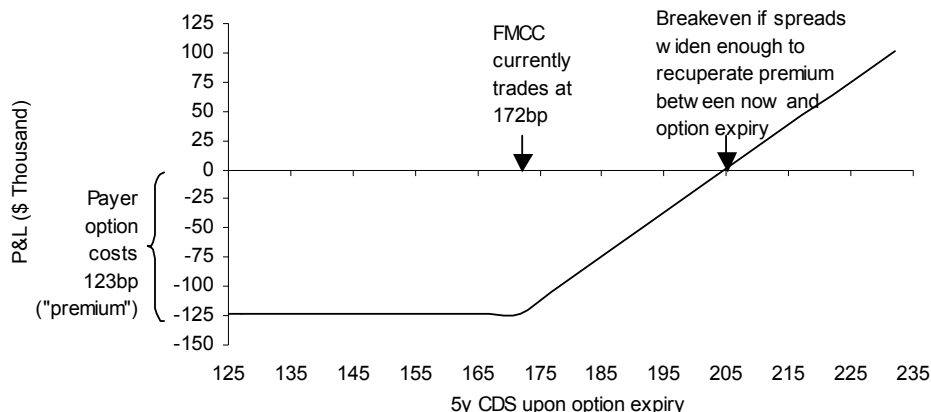
In the sections that follow, we first explain how payer and receiver options—the credit default market’s version of puts and calls—work. We then show how these contracts may be used to express a directional view on credit or to hedge risk. Within this framework, we integrate trading ideas applicable to the current market environment, explaining both upside potential and downside risk. We then show how the Credit OAS (COAS) methodology can help investors predict the probability that an option will expire in-the-money, resulting in profits. We conclude by explaining how swaption payoffs change in the event of a credit default.

Payer Options

A payer option is the right to buy credit default protection at a pre-specified level (“strike”) on a future date

A payer option is the right to buy credit default protection at a pre-specified level (“strike”) on a future date. The investor makes money if credit default spreads widen sufficiently to recoup the premium paid for the option. For example, suppose that an investor buys a four-month at-the-money payer option on five-year Ford Motor Credit protection, struck at 172 bps. (An at-the-money option means that the strike is the same as the current Ford Motor Credit level, or 172 bps.) The investor exercises the option if, four months from now, five-year Ford Motor Credit default protection trades wider than 172 bps:

Figure 2. Sample P&L Upon Payer Option Expiry for 5y Ford Motor Credit, 19 Aug 04



19-Aug-04	Strike	Cost	20-Dec-04	Future	Exercise	Profit
(bp)	(bp)	(bp)	(bp)	DV01	Option?	(\$000s)
172	172	123	225	3.7	Yes	$3.7 \times (225 - 172) - 123 = 73$
172	172	123	165	3.8	No	-123

For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.
 Source: Banc of America Securities LLC estimates.

The investor’s profit is the DV01 of five-year Ford Motor Credit (\$3,750 per \$10 million notional, or 3.75) times the spread widening, less the premium paid. Spread widening is defined as the spread upon option expiry minus the 172-bp strike. This is the diagonal line in Figure 2. Should Ford Motor Credit trade tighter than 172 bps, the option would expire worthless, and the investor would lose the premium paid. This is the horizontal line in Figure 2.

A payer option is both a put option on credit and a call option on spreads

A payer option is a put option on credit, because the buyer makes money when credit quality deteriorates—a bearish view. **A payer option may also be thought of as a call option on spreads**, because spreads widen when credit quality deteriorates. For this reason, credit default swaptions use the lingo “payer” and “receiver,” instead of “put” and “call”: a payer option is both a put option on credit quality—a bet that credit will deteriorate—and a call option on spreads—a bet that spreads will widen.

We note that buying a payer option is often an expensive way to short credit. In the Ford example presented above, the cost to buy a payer option is 123 bps, versus 58 bps carry on buying credit default protection outright (172 bps over four months from August to December). Therefore, buying a payer option is often more appropriate for a bearish investor who also believes there is a significant probability that he will be wrong (i.e., that spreads may tighten). In this example, the breakeven on the downside is a five-year Ford Motor Credit spread upon option expiry of 155 bps (172 bps, minus the 65-bp difference between the 58 bps carry and the 123 bps option premium, divided by a DV01 of 3.75). If spreads are wider than 155 bps, the investor would have been better off buying straight CDS; if spreads are tighter than 155 bps, the investor was better off buying the payer option.

Alternatively, an investor may buy a payer option as a form of “disaster insurance”, hedging against the risk that spreads will widen very significantly, with little to no warning. In this case, an investor buys a deep out-of-the-money payer option—an option that is unlikely to be exercised, but costs relatively little—to insure against a worst case scenario. This strategy makes more sense than buying regular protection, because the investor does not actually expect spreads to widen dramatically. He just wants to insure against the possibility that a major event—for instance, a terrorist attack or a dramatic overnight rise in the price of oil—may prove him wrong.

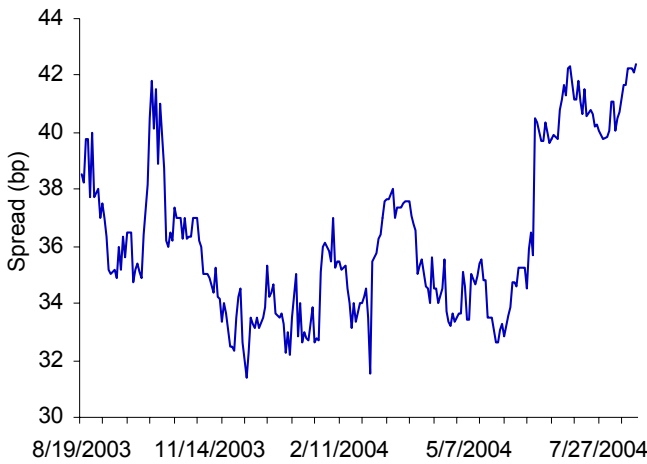
Selling a Payer Option

An investor who sells a payer option has the reverse payoffs of the buyer. If credit spreads are wider than the strike upon expiry, the buyer exercises the option, and the seller loses money. On the other hand, if credit spreads are tighter than the strike, the option expires worthless, and the seller keeps the upfront premium.

An investor can buy CDS and sell an out-of-the-money payer option to short a credit at little or no cost

A potential buyer of credit default protection can express an overall bearish view on credit at little or no cost by buying CDS and selling an out-of-the-money payer option. Consider a four-month (December 20, 2004) option on Nordstrom, whose five-year credit default protection currently trades around 42 bps. Despite higher second quarter earnings, suppose that an investor has a bearish view on the retail industry and believes that mixed economic data will cause credit spreads to continue to widen going forward. However, the investor does not want to pay the four-month carry of 14 bps for buying CDS. By selling an out-of-the-money payer option, the bearish investor takes in upfront premium to reduce the cost of carry on buying CDS. At the same time, the investor will continue to profit if CDS widens, up to the strike of the payer:

**Figure 3. To Short Nordstrom at Close to Zero Cost...
5y Nordstrom CDS, 19 Aug 03—18 Aug 04**

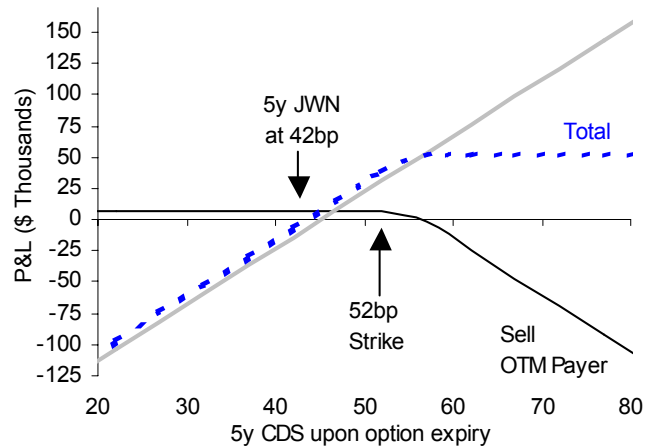


Source: Bloomberg.

The investor gives up some upside to reduce the cost of carry from buying CDS

In this scenario, the investor buys Nordstrom CDS at 42 bps and sells a payer with a strike of 55 bps. The proceeds from selling the payer option halve the cost of carry from buying straight five-year credit default protection. By combining a bearish view (buying CDS) with a bullish view (selling a payer option), the investor is able to short five-year Nordstrom protection at a carry of just 7 bps. The investor also retains all the upside from spread widening up to 55 bps. (It is possible to reduce the cost of carry all the way to zero, but this would only allow the investor to capture the upside from spread widening through 48 bps.)

**Figure 4. ...Buy CDS and Sell a Payer Option
Sample P&L Upon 20 Dec 04 Option Expiry for JWN, 19 Aug 04
Based on a notional of \$10 million**



For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.

Source: Banc of America Securities LLC estimates

Receiver Options

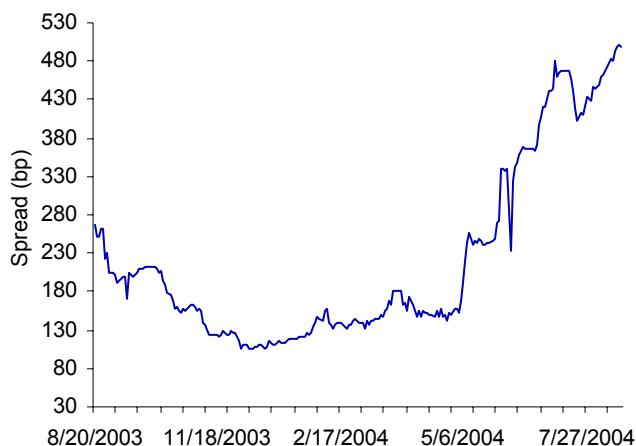
A receiver option is the right to sell credit default protection at a pre-specified level ("strike") on a future date

A receiver option is the right to sell credit default protection at a pre-specified level ("strike") on a future date. The investor makes money if spreads tighten through the strike by enough to recuperate the option premium. If spreads widen, the option expires worthless, and the investor loses the premium paid.

For example, suppose that an investor buys a four-month receiver option on crossover credits Toys R Us (Ba2/BB) or Bombardier (Baa3/BBB-). As Figure 5 shows, spreads at Bombardier have recently widened in light of lower orders for commercial aircraft—the company supplies jets for near-bankrupt Delta Air Lines and US Airways—and a first-quarter loss in railway cars. An investor who believes the issuer will remain investment-grade may consider this spread widening overdone and expect spreads to tighten. Our high grade credit analyst, Dave Peterson, maintains a buy (long credit) recommendation on the issuer.¹

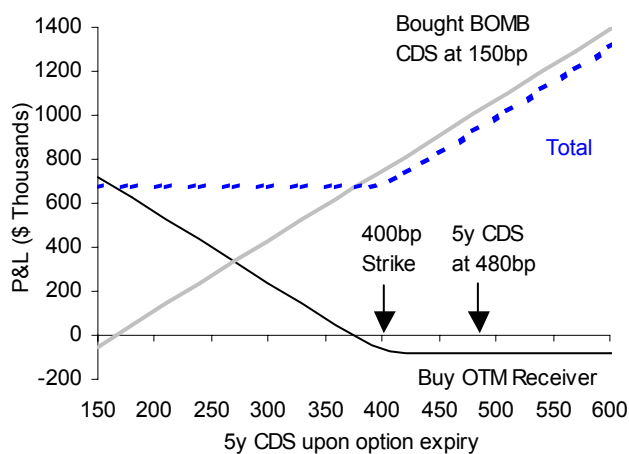
Similarly, an investor who already owns credit default protection can buy a receiver option to hedge downside loss should spreads tighten. In this case, the investor continues to profit if spreads widen, less the receiver option premium, but he also locks in profits should spreads tighten through the strike. Consider an investor who bought Bombardier in late-April 2004 at 150 bps, and who now buys a receiver option with a strike of 400 bps to lock in gains:

**Figure 5. To Lock in Bombardier Gains...
5y Bombardier CDS, 19 Aug 03—18 Aug 04**



Source: Bloomberg.

**Figure 6. ...Buy a Receiver Option
Sample P&L at 20 Dec 04 Option Expiry for BOMB, 19 Aug 04
Based on a Notional of \$10 Million**



For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.

Source: Banc of America Securities LLC estimates

¹ David K. Peterson and William P. Woodbridge, "BAS Investment Grade A&D Monthly: Second Quarter 2004 Results—Triple Double!", August 23, 2004. On Toys R Us, see Christopher Brown, "Big News in Toyland, Or Is It?" *Situation Room*, August 11, 2004.

Figure 7. Sample P&L for an Investor Who Bought Bombardier in Late April 2004, Who Hedges Risk by Buying a Receiver Option Based on a Notional of \$10 Million

Late 04-Apr-04 (bp)	19-Aug-04 (bp)	Strike (bp)	Option Cost (bp)	CDS Carry Cost (bp)	20-Dec-04 (bp)	Future DV01	Exercise Option?	Profit from Hedged Strategy (\$000s)	Profit from Straight CDS (\$000s)	Difference (\$000s)
150	480	400	80	50	200	3.7	Yes	620	135	485
150	480	400	80	50	340	3.2	Yes	620	558	62
150	480	400	80	50	500	2.8	No	850	930	-80
150	480	400	80	50	600	2.6	No	1040	1120	-80

For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.
Source: Banc of America Securities LLC estimates.

This strategy essentially uses a receiver option to hedge against the risk that the investor will go home tonight and come in tomorrow morning to find out that news on Bombardier sent spreads through 400 bps. The cost of \$80,000 per \$10 million is quite reasonable, as it equates to a mark-to-market spread tightening of 25 bps at a DV01 of 3.2 (80-bp option cost / 3.2 DV01 = 25-bp spread).

A receiver option is both a call option on credit and a put option on spreads

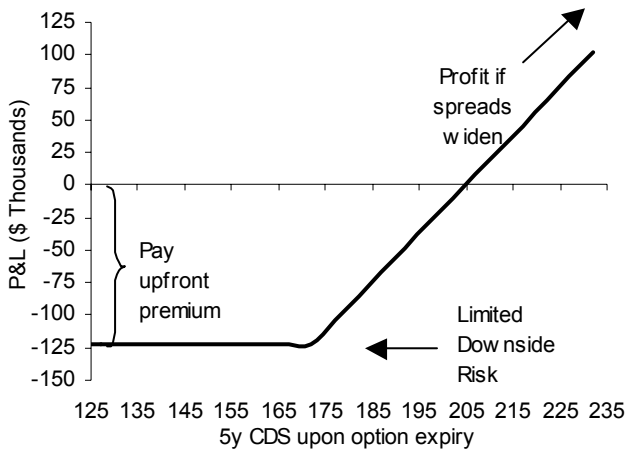
A receiver option is a call option on credit, because the buyer makes money when credit quality improves—a bullish view. **A receiver option may also be thought of as a put option on spreads**, because spreads tighten when credit quality improves.

Selling A Receiver Option

Selling a receiver option has a different payoff than buying a payer option, even though both express bearish views

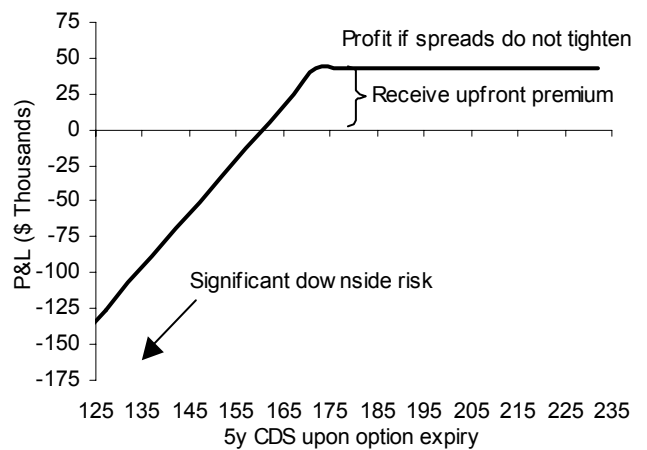
Like the buyer of a payer option, the seller of a receiver option expresses a bearish view on credit. However, the payoff structure differs. While the buyer of a payer option pays money upfront (negative carry) and profits if spreads sufficiently widen, the seller of a receiver option receives money upfront (positive carry) and profits as long as spreads do not tighten. Figure 8 illustrates the difference:

Figure 8. Payoff for the Buyer of a Payer Option... 4m ATM Payer on 5y FMCC (172 bps strike), offered at 123 bps Based on a Notional of \$10 Million



For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.
Source: Banc of America Securities LLC estimates.

Figure 9. ...and the Seller of a Receiver Option. 4m ATM Receiver on 5y FMCC (172 bps strike), bid at 43 bps Based on a Notional of \$10 Million



For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.
Source: Banc of America Securities LLC estimates.

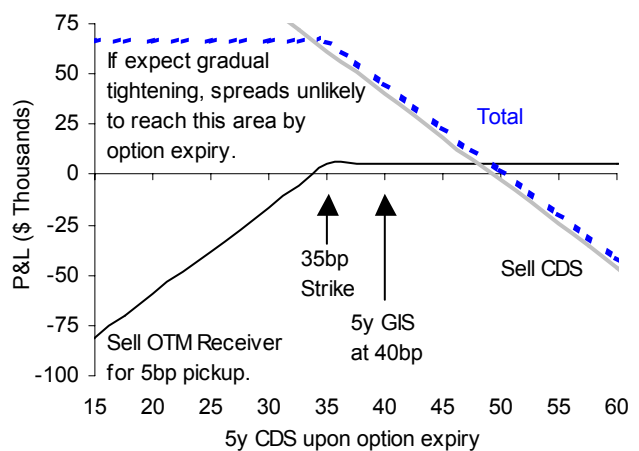
For example, in General Mills (Baa2/BBB+), Todd Duvick, our high grade food and beverage analyst, looks for long-term tightening in the credit as the company continues to implement a three-year, \$2 billion debt reduction program that ends in May 2006. So far, the company has paid down \$581 million (29%) of debt, and expects to repay another \$625 million (31%) in fiscal year 2005. However, Duvick sees downside risk potential from a pending SEC investigation and the continuing anti-carbohydrate diet fad, which hurt the earnings potential of a cereal manufacturer.² A seller of CDS may also consider selling an out-of-the-money receiver; for example, a 35 bps strike receiver, bid at 5 bps. While this position caps upside potential, the premium from selling the receiver provides a cushion to unwind the position should the SEC investigation send spreads wider. Moreover, the yield pickup allows an investor to sell protection at a 5-bp pickup over straight five-year CDS.

**Figure 10. Add Spread and Hedge Risk at General Mills...
5y General Mills CDS, 19 Aug 03—18 Aug 04**



2003 data reflect a three-day moving average of spreads from Bloomberg.
Sources: Bloomberg, Banc of America Securities LLC estimates.

**Figure 11. ...By Selling a Receiver Option.
Sample P&L Upon 20 Dec 04 Option Expiry for GIS, 19 Aug 04
Based on a notional of \$10 million**



For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.
Source: Banc of America Securities LLC estimates.

**Figure 12. Sample P&L for an Investor Who Sells General Mills CDS
and Sells a Receiver Option to Hedge Against Spread Widening
Based on a Notional of \$10 Million**

19-Aug-04 (bp)	Strike (bp)	Option Premium (bp)	CDS Carry (bp)	20-Dec-04 (bp)	Future DV01	Option Exercised?	Profit from Hedged Strategy (\$000s)	Profit from Straight CDS (\$000s)	Difference (\$000s)
40	35	5	13	33	4.2	Yes	64.4	70.1	-5.7
40	35	5	13	35	4.2	Yes	66.5	61.5	5
40	35	5	13	45	4.2	No	23.5	18.5	5
40	35	5	13	50	4.2	No	2	-3	5

For simplicity, we ignore the effect of convexity. Accordingly, profit upon expiry is not exact.
Source: Banc of America Securities LLC estimates.

² Todd Duvick and Colin M. Santana, "General Mills Inc. (Baa2/BBB+): Big G Debt Reduction Drumbeat Continues," July 2, 2004.

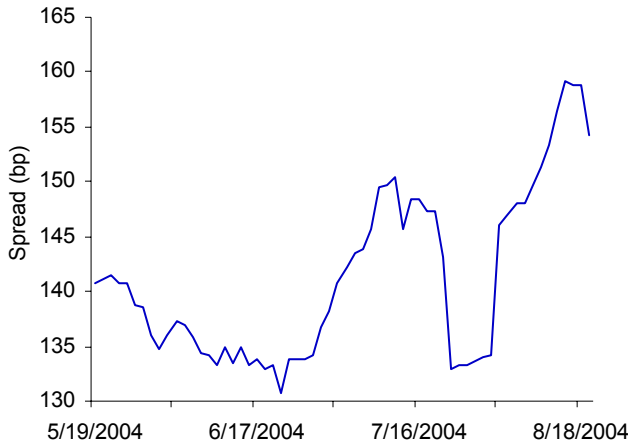
Straddles

A straddle is a bet on an issuer's volatility, not a bullish or bearish view on credit

An investor may combine a payer and a receiver option to create a straddle, which is a bet on volatility. Instead of making money if spreads widen, and losing money if spreads tighten—as with a payer option—the buyer of a straddle makes money if spreads either widen or tighten by more than a breakeven level. The seller of a straddle takes in premium upfront, and makes money if spreads stay narrower than a breakeven range. That is, the seller of an at-the-money straddle believes that spread volatility will decrease from current levels.

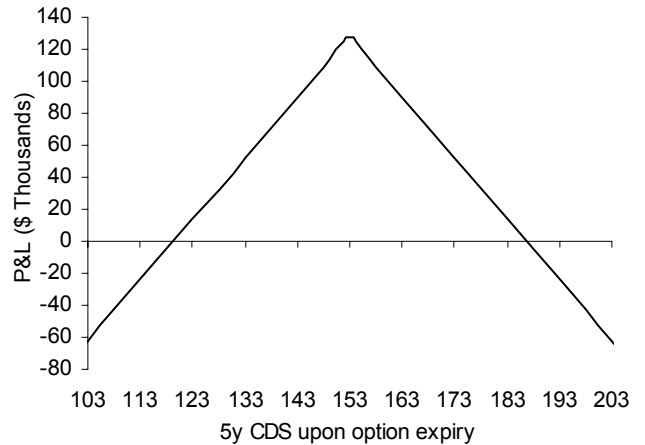
As an example, consider an investor who believes that spread volatility will decrease at Sun Microsystems, which has widened about 20 bps since mid-June 2004. This investor will profit from selling an at-the-money straddle as long as spreads stay within a 33-bp range, either wider or tighter, between August and December 2004. This compares with a 30-bp range in which Sun has traded over the past three months. A payoff diagram looks as follows:

**Figure 13. If You Think Spread Volatility Will Decrease...
5y Sun Microsystems CDS, 19 May 03—18 Aug 04**



Source: Bloomberg.

**Figure 14. ...Consider Selling a Straddle.
Sample P&L Upon 20 Dec 04 Expiry for SUNW, 19 Aug 04
Based on a Notional of \$10 Million**



For simplicity, we ignore the effect of convexity. Accordingly, profit upon option expiry is not exact.

Source: Banc of America Securities LLC estimates.

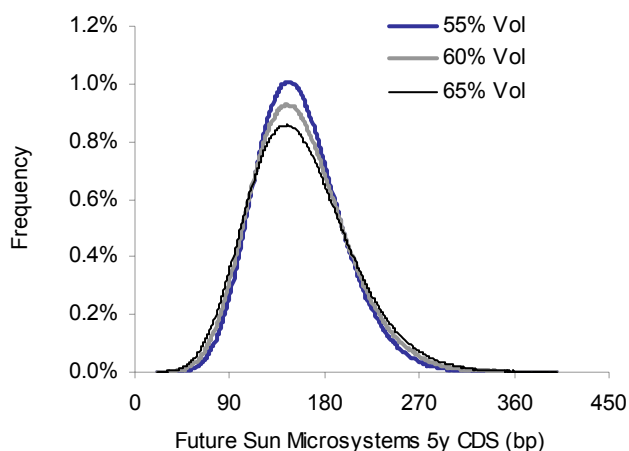
Using Credit OAS to Analyze Expected Payoffs³

Using COAS, we can predict the likelihood that a credit default swaption will expire in-the-money

The Credit OAS (COAS) model uses the equity market to assess the relative value of credit spreads. Using implied equity volatility—a forward-looking measure of potential future changes in stock price—the COAS model generates a distribution of possible spreads at a point in the future. That is, we use the equity market to infer the likelihood that spreads on a particular issuer will remain unchanged, will widen 10 bps, will widen 20 bps, will tighten 40 bps, and so on. Based on this distribution, we can infer the likelihood that a credit swaption will result in profits for an investor.⁴

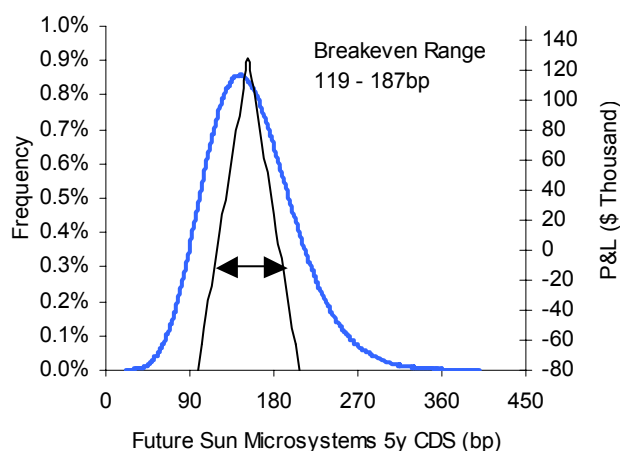
As an example, consider the volatility straddle on Sun Microsystems. Figure 15 shows the COAS model implied spread distribution at 65% equity volatility (August 19, 2004), as well as the implied spread distribution at a 60% and 55% equity volatility. (We implicitly assume that the stock price remains unchanged.) We then superimpose the profit and loss diagram for buying the volatility straddle.

Figure 15. Sun Microsystems Implied Spread Distribution
Based on COAS Model at Various Implied Equity Volatilities
19 Aug 04



Source: Banc of America Securities LLC estimates.

Figure 16. Probability of Keeping Upfront Premium by Selling an ATM Straddle on 5y Sun Microsystems
Based on a 65% Implied Equity Volatility
19 Aug 04



Source: Banc of America Securities LLC estimates.

We make this prediction based on the underlying issuer's equity volatility

Based on this methodology, we estimate the likelihood of making money on the Sun Microsystems straddle to be 54%. This calculation assumes that equity volatility remains unchanged, based on the average of short-term equity put and call option implied volatilities. In practice, the term structure of volatility is often downward-sloping, meaning that equity volatility tends to fall at longer-dated horizons. Should equity volatility fall to 60%, we estimate that the probability of the investor making money on the straddle rises to 57%, and to 61% if equity volatility falls to 55%.

³ Note, this analysis is not intended to represent a recommendation or investment advice with respect to any particular issuer and merely represents the results generated by our Credit OAS proprietary credit evaluation model. For a more detailed description of this model, including the data input into the model, please see "Introducing Credit Option Adjusted Spread and Lighthouse", *Credit Market Strategist*, 16 December 2002 and "A Hundred Years of Flight, One of Lighthouse and Credit OAS", *Credit Market Strategist*, 23 December 2003.

⁴ For details on the mechanics of the model, please see "Volatility Trading Strategies in Corporate Bond Spreads" and "Quantitative Focus: Implied-Implied Spread Volatility," *Credit Market Strategist*, March 1, 2004.

A Note on DV01

For simplicity, we have ignored the effect of convexity on profit and loss, only describing total payout as a function of spread movement times the DV01 of the option. We make two points. First, for large spread moves, profit and loss will be reduced (or amplified) by convexity. For instance, in the Bombardier example, if spreads widen from 150 bps to 600 bps, a buyer of straight CDS would actually make about \$1.48 million per \$10 million notional—far more than the \$1.12 million per \$10 million notional approximation in Figure 7. But if spreads widen from 150 bps to just 200 bps, a buyer of straight CDS would make about \$151,000 per \$10 million notional, making the DV01 approximation of \$135,000 per \$10 million notional in Figure 7 more realistic. Second, the correct DV01 to use is forward DV01—that is, the DV01 of the credit default swap upon option expiry. For reasonably small spread movements and short-term options, both of these effects should be fairly small, but investors should keep these factors in mind when assessing potential payoffs.

Knockout Provisions: What Happens Following a Credit Event

A receiver option becomes worthless following a credit event

A payer option becomes worthless following a credit event only if there is a knockout provision

A receiver option becomes worthless following a credit event. The buyer of a receiver contract does not exercise, because he would sell credit default protection and immediately owe par minus recovery, which would result in an overall loss. Instead, the buyer of a receiver option loses the premium paid to the seller.

A payer option becomes worthless following a credit event only if there is a knockout provision. This provision, a typical feature in credit default swaption contracts, specifies that the option contract automatically terminates following a credit event, with the buyer losing the premium paid to the seller. **If there is not a knockout provision, the buyer of a payer option exercises.** The buyer receives par, delivers a physical bond (or cash settles at the recovery rate), and earns $(100 - \text{recovery})\%$ times the notional amount of the contract, less the premium paid. The seller keeps the premium, but loses $(100 - \text{recovery})\%$ times the notional. Figure 17 lays out the payoffs following a credit event in the same 2x2 matrix format shown in Figure 1.

Figure 17. Single-Name Credit Default Swaption Payoffs Following a Credit Event

	Bullish	Bearish
Less Risk	<p>Buy Receiver Investor does not exercise, because he would sell CDS and owe par - recovery Lose Premium</p>	<p>Buy Payer Exercise if no knockout Profit is $(100 - \text{Recovery})\% - \text{premium}$ If knockout, contract ends and lose premium</p>
More Risk	<p>Sell Payer Buyer exercises if no knockout Loss is $(100 - \text{Recovery})\% - \text{premium}$ If knockout, contract ends and lose premium</p>	<p>Sell Receiver Buyer does not exercise, because he would sell CDS and owe par - recovery Keep Premium</p>

Source: Banc of America Securities LLC estimates.

Most contracts contain knockout provisions

The difference in price between a payer option with a knockout provision and one without a knockout provision is the present value of credit default protection for the length of the option contract (say, three months). This cost can be significant given that the front-end of a credit default curve is often quite steep. Moreover, since most investors are comfortable assuming that an underlying credit is unlikely to default before option expiry, most credit default swaption contracts contain knockout provisions.

Conclusion

We conclude by presenting a brief summary of the types of credit swaptions discussed herein, and of the trading strategies discussed for each type of option.

- ◆ **The buyer of a payer option expresses a bearish view on credit.**
- ◆ **The seller of a payer option expresses a bullish view on credit,** which can be combined with buying conventional CDS to create a (close to) zero cost short strategy. An investor who has an overall bearish view on Nordstrom can eliminate most of the negative carry from buying five-year CDS by also selling an out-of-the-money payer option.
- ◆ **The buyer of a receiver option also expresses a bullish view on credit.** This strategy involves less risk than selling a naked payer option, but involves paying an upfront premium. An investor who thinks that spread widening is overdone in Bombardier or Toys R Us should consider buying a receiver option. For accounts that have already bought credit default protection, buying a receiver option can also lock in existing mark-to-market gains.
- ◆ **The seller of a receiver option expresses a bearish view on credit.** With General Mills, consider selling a receiver option and selling CDS to pick up incremental spread, while also hedging the downside risk of a pending SEC investigation and of popular anti-carbohydrate diets. We expect spread tightening to be gradual, and therefore we are not overly concerned that this strategy would cap upside potential.
- ◆ **The buyer of a straddle expresses a view that credit volatility will increase, without a view on the direction of spreads.**
- ◆ **The seller of a straddle expresses a view that credit volatility will either decrease or stay range-bound, in a fashion exactly opposite to the buyer of a straddle.**
- ◆ **Credit OAS helps investors to assess the probability that their option will expire in-the-money,** so that they can assess the desirability of different option strikes within an issuer, or of the same option strike across issuers.
- ◆ **Following a credit event, a receiver option becomes worthless.** A payer option becomes worthless if the option contains a knockout provisions. Otherwise, the buyer of a payer option exercises.

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